**MINISTRY OF HEALTH OF UKRAINE**

**ODESA NATIONAL MEDICAL UNIVERSITY**

**Faculty** *Medicine*

**Department** *of Surgery with Postgraduate Education*

**APPROVED BY**

**Vice-Rector for Scientific and Pedagogical Work**

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**'____' _____ 2025**

# METHODOLOGICAL RECOMMENDATIONS FOR PRACTICAL CLASSES OF THE ACADEMIC DISCIPLINE

Faculty, course Medical 6th year

Academic discipline Surgery

*(name of the discipline)*

## PRACTICAL CLASSES

*Practical class № 9*

**Topic: "Acute abdominal syndrome. Diagnostics, differential diagnostics and treatment tactics. Differential diagnostics of acute diseases of the abdominal cavity"**

**Approved:**

At the meeting of the Department *of Surgery with Postgraduate Education* of Odesa National Medical University

**Odesa National Medical University**

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## PRACTICAL CLASSES

*Practical class № 9*

**Topic of the practical class: "Acute abdominal syndrome. Diagnostics, differential diagnostics and treatment tactics. Differential diagnostics of acute diseases of the abdominal cavity"- 6 hours**

**1. Relevance of the topic.**

Acute surgical pathology of the abdominal cavity belongs to the group of diseases that require urgent emergency measures aimed at saving the patient's life. This is due to the clinical course of surgical diseases and is characterised by the fact that every moment from the moment of illness there is a real threat to the life of patients in case of failure to provide assistance.

Acute abdomen is a generalised concept that includes a number of surgical abdominal diseases, as well as related specialities (urology, gynaecology, therapy, cardiology), etc.

**2. Objectives of the lesson:**

**2.1. Learning objectives:**

The student should learn:

1. nosological forms of acute surgical pathology of the abdominal cavity, which are included in the concept of acute abdomen; II level

2. Basic provisions of emergency care for urgent surgical patients, terms of hospitalisation, the term of surgical interventions from the moment of illness and hospitalisation in surgical hospitals; II level

3. Principles of emergency care: conservative therapy, urgent surgical interventions, the scope of surgery for different nosological units; III level

4. Rules of medical documentation in case of 'acute abdomen'; III level

**2.2 Educational objectives:**

1. To develop clinical thinking in higher education students.
2. Using specific examples, to educate higher education students to feel responsible for their own business, principles of medical ethics and deontology in surgery, medical confidentiality, strict industrial discipline and professional subordination.

**3. Interdisciplinary integration.**

| № | Disciplines | To know | To be able to. |
|---|---|---|---|
| 1 | 2 | 3 | 4 |
| **I. Previous disciplines** | | | |
| 1. | Anatomy | Surgical anatomy of the abdominal cavity. | Be able to show the projection of the abdominal organs on the abdominal wall. |
| 2. | Physiology and pathophysiology | Features of functioning and interrelationships of the abdominal organs. Pathological influence of abdominal organs on each other. | Be able to interpret changes in the abdominal organs in diseases of other organs. |

| | | | |
|---|---|---|---|
| 3. | Biochemistry | Biochemical changes in the abdominal organs and the whole body during inflammatory and other diseases of the abdominal cavity | Be able to interpret laboratory data in acute abdomen. |
| 4. | Pharmacology | Effect of pharmacological drugs on the abdominal organs | Identify indications and contraindications for prescribing pharmacological drugs in patients with ‘acute abdomen’ |
| 5. | Emergency medical care | Features of emergency medical care for patients with ‘acute abdomen’ | To be able to build a scheme for the provision of medical care, including surgery, to patients with ‘acute abdomen’ |
| **II. Intra-subject integration** | | | |
| 1. | Anatomical and physiological changes during pregnancy | Topographic and anatomical relationships of the abdominal organs | Know the projection of the abdominal organs on the anterior abdominal wall and their relationship and location in relation to the peritoneum |
| 2. | Modern views on the etiology and pathogenesis of acute surgical pathology of organs of the abdominal cavity; | To know the current views on the etiology of diseases that make up the concept of ‘acute abdomen’ | Know the etiology, pathogenesis and course of major acute diseases of the abdominal cavity |

| | | | |
|---|---|---|---|
| 3. | classification of acute surgical pathology of the abdominal cavity; | Know the classification of acute surgical pathology of the abdominal cavity | The main features that make acute diseases of the abdominal cavity similar and different |
| 4. | clinical features of the course of acute surgical pathology of the abdominal cavity; | Know the clinical features of the course of acute surgical pathology of the abdominal cavity | Be able to determine the prognosis of the course of pathology related to 'acute abdomen' |
| 5. | additional methods of examination, mandatory laboratory, auxiliary (X-ray, ultrasound, etc.), which are used in doubtful cases; differential diagnosis of acute surgical pathology of the abdominal cavity; Principles of emergency care for acute surgical pathology of the abdominal cavity | Know additional methods of examination, mandatory laboratory, auxiliary (X-ray, ultrasound, etc.), which are used in doubtful cases | Analyse the results of laboratory and instrumental studies |
| | | Know the differential diagnosis of acute surgical pathology of the abdominal cavity | Be able to make a differential diagnosis of diseases related to 'acute abdomen'. The concept of 'false acute abdomen' |
| | | Know the basic principles of emergency care in acute surgical pathology of the abdominal cavity | To be able to develop tactics for the examination and treatment of a patient with an 'acute abdomen' |

## 4. Content of the lesson

Acute abdominal pain is the most common complaint in abdominal surgery. The condition referred to as '**acute abdomen**' is often an indication for surgical intervention before a definitive diagnosis is made. Delaying the start of surgery can be fatal; at the same time, a detailed history and a thorough physical examination are required for differential diagnosis and selection of treatment tactics. Usually, painkillers are not prescribed for

abdominal pain until the examination is complete. Before the operation, the surgeon should be able to assess the clinical picture, which should not be distorted by the effect of narcotic analgesics. However, in some cases (for example, when a patient does not allow himself to be examined due to severe pain), the administration of small doses of narcotic analgesics is likely to alleviate suffering, increase trust in the doctor, and allow for a complete and thorough examination. The effect of narcotic analgesics can be eliminated by administering naloxone. Finding out the cause of acute abdominal pain is like solving a puzzle. You have to compare a lot of facts - anamnesis data, results of physical, laboratory, X-ray examinations. However, it is not necessary to use all available diagnostic methods (for example, not every patient with acute abdominal pain needs an urgent CT scan).

Acute abdominal pain. Differential diagnosis based on the location of the pain.

**Right hypochondrium**

Lungs and chest
Right-sided lower lobe pneumonia
Fractures of the right lower ribs
Pulmonary embolism and pulmonary infarction
Liver
Acute hepatitis (any etiology)
Hepatomegaly (any etiology)
Sequestration crisis with blood deposition in the liver (sickle cell anaemia)
Liver tumours (benign and malignant)
Liver abscess
Liver trauma
Biliary tract
Acute cholecystitis and biliary colic Chronic cholecystitis
Biliary dyskinesia
Calculous pancreatitis

***Stomach***

Exacerbation of gastric ulcer
Gastritis
Acute gastric dilatation
Breakthrough gastric ulcer

***Duodenum***

Exacerbation of duodenal ulcer
Breakthrough duodenal ulcer
Pancreas
Acute pancreatitis (pain in both the right and left hypochondrium)
Cancer of the head of the pancreas

**Kidneys**

Pyelonephritis (pain in the rib-spinal angle)
Renal colic

**Heart**

Angina pectoris and myocardial infarction
Pericarditis

**Intestines**

Retrocecal appendicitis

**Other causes**

Herpes Zoster
Subdiaphragmatic abscess
**Epigastric region**
***Heart***
Angina pectoris and myocardial infarction Pericarditis
**Oesophagus, stomach and intestines**
Esophagitis Gastritis
Gastric ulcer and duodenal ulcer
Hernia of the esophageal opening of the diaphragm and its complications
Perforation of the esophagus
Achalasia of the cardia
Pancreas of the pancreas
Acute pancreatitis
Tumours of the pancreas
Other causes
Fracture of the sternum
Tietze syndrome (rib chondritis)
**Left hypochondrium**
**Lungs and chest**
Left lower lobe pneumonia Fractures of the left lower ribs
**Spleen**
Splenomegaly (of any etiology) Spleen injury
Abscess of the spleen
Aneurysm of the splenic artery
**Stomach**
Tumours of the stomach (benign and malignant) Gastritis
Exacerbation of gastric ulcer Breakthrough gastric ulcer
**Pancreas**
Acute pancreatitis (pain in both the right and left hypochondrium) Pancreatic tail cancer
Cyst and pseudocyst of the pancreas
***Kidneys***
Pyelonephritis
Renal colic
***Heart***
Angina pectoris and myocardial infarction
**Intestines**
Tumours of the colon in the left bend area
**Umbilical region**
**Pancreas**
Pancreatitis
Tumours of the pancreas (benign and malignant)
Intestines
Mechanical intestinal obstruction
Appendicitis (early stage)
Thrombosis and embolism of mesenteric vessels, intestinal infarction (early stage)
Inguinal hernia strangulation
Umbilical hernia
Abdominal aortic aneurysm with dissection, aneurysm rupture

Diverticulitis (small and large intestine)
Gastroenteritis
Large omentum torsion
**Other causes**
Uremia and other metabolic disorders Leukaemia
Painful crisis (sickle cell anaemia)
**Right iliac region**
**Intestines**
Acute appendicitis
Acute mesadenitis
Inguinal hernia strangulation
Hernia of the spigelian line Ileitis (Crohn's disease)
Breakthrough of the cecum (neoplasm, foreign body, diverticulitis)
Inflammation of Meckel's diverticulum
Tiflite (in case of neutropenia)
Diverticulitis of the sigmoid colon (in case of dolichosigma) Gastric or duodenal ulcer
Breakthrough ulcer Pelvorectal paraproctitis
***Kidneys***
Pyelonephritis
Renal colic
**Female genital organs**
Acute salpingitis, piosalpinx, pyovar Ectopic pregnancy
Torsion of the ovarian cyst pedicle Endometriosis
Ovulatory pain
**Vessels**
Aneurysm of the iliac artery
**Other causes**
Psoas abscess
Hematoma of the vagina of the rectus abdominis muscle
**Left iliac region**
**Intestine**
Diverticulitis of the sigmoid colon
Rupture of the descending colon (neoplasm, foreign body) Inguinal hernia strangulation
Hernia of the spigelian line
Pelvorectal paraproctitis
**Female genital organs**
Acute salpingitis, piosalpinx, pyovar
Ectopic pregnancy
Ovarian cyst pedicle torsion
Endometriosis
***Kidneys***
Pyelonephritis
Renal colic
***Other causes***
Psoas abscess
Abdominal aortic aneurysm rupture
Hematoma of the vagina of the rectus abdominis muscle
Fatty suspension of the colon

Aneurysm of the iliac artery

**Anamnesis**

The questioning begins with finding out the circumstances of the pain. The history should provide answers to the following questions:

**A. Localisation of pain.** Diseases of some internal organs are accompanied by pain of a very specific localisation. The occurrence of pain in the projection of the affected organ is due to irritation of the parietal peritoneum (for example, in acute cholecystitis and appendicitis). Therefore, first of all, diseases of those organs that are located in the immediate vicinity of the pain focus should be assumed. Diseases of the retroperitoneal organs (kidneys, pancreas) are usually accompanied by back or side pain, but often cause acute abdominal pain, which confuses the doctor. Diseases of organs that do not come into contact with the parietal peritoneum, as well as non-inflammatory diseases of the abdominal cavity (for example, the initial stage of mechanical small bowel obstruction) are accompanied by a diffuse pain without a clear localisation. Diseases of organs located directly adjacent to each other often give such a similar clinical picture that the differential diagnosis is difficult even for an experienced doctor.

**B. Irradiation of pain** is an important diagnostic sign that complements the clinical picture. In case of damage to the organs of the subdiaphragmatic space (splenic rupture, haemoperitoneum, abscess), the pain irradiates to the upper arm and lateral neck surface on the side of the lesion, as the diaphragm is innervated by the IV cervical spinal nerve. In case of biliary colic, the pain usually involves the right hypochondrium and radiates to the right shoulder and under the right shoulder blade. Pain in pancreatitis usually radiates to the back, it is often called girdling pain. Pain in renal colic usually begins in the side, radiates to the groin along the ureter and is accompanied by rapid and painful urination.

**C. The nature of the pain.** Abdominal pain can be constant or spastic (colic).

***1. 1. Constant pain*** can increase and decrease, but does not go away completely and does not occur in the form of attacks. Constant pain is typical for inflammatory and tumour diseases of internal organs. The pain that occurs in acute cholecystitis is often identified with biliary colic. This is incorrect - with acute cholecystitis, the pain is constant and unchanged in intensity.

***2. 2. Cramping pain*** usually occurs when an empty organ is obstructed (intestinal obstruction, urolithiasis) or when the pressure in the organ lumen increases due to other causes (increased peristalsis after the end of paralytic intestinal obstruction, gastroenteritis). It should be remembered that some diseases begin with spasmodic pain, which then becomes permanent (intestinal obstruction complicated by intestinal infarction).

**D. Duration of pain.** Episodic short-term pain that is not accompanied by other clinical symptoms and changes in laboratory parameters is rarely a consequence of a serious disease. On the contrary, prolonged constant or cramping pain almost always indicates a pathological process. In most surgical diseases, pain lasts from several hours to several days. Pain that lasts for months is usually not dangerous. Urgent hospitalisation is required only if they are accompanied by a sharp deterioration in the condition (a classic example is a duodenal ulcer). If the patient complains of abdominal pain that lasts for years, one should suspect a simulation or mental disorder, and assess the patient's social and living conditions.

**E. Pain intensity.** As a rule, the more severe the surgical disease, the stronger the pain that accompanies it. The pain that occurs when the contents of the gastrointestinal tract enter the abdominal cavity can be so severe that even the most patient patients are forced to consult a doctor. Almost all patients intuitively correctly assess their own condition and the intensity

of pain. Therefore, complaints of painful sensations in the abdomen, even in an outwardly healthy person, that have arisen for the first time, should not be ignored.

**F. The onset of pain.** In some surgical diseases (perforation of a hollow organ, thromboembolism of an artery, compression of the vessels of organs that are well supplied with blood), acute abdominal pain appears suddenly, often against the background of good health. The status rapidly deteriorates. The patient willingly and in detail describes the circumstances of the pain. In other diseases - appendicitis, diverticulitis, mechanical intestinal obstruction - pain does not develop so quickly, but after a few hours the pain can become very severe.

**G. Vomiting.** Some diseases are always accompanied by persistent vomiting, in others it is rare or absent. Frequent vomiting is characteristic of the initial stage of acute pancreatitis and acute cholecystitis. In mechanical intestinal obstruction, the frequency and intensity of vomiting depend on the localization of the obstruction: the higher it is, the more frequent the vomiting. Vomiting with a fecal odor indicates colonic obstruction or gastro-colonic fistula. The absence of bile in the vomit means obstruction of the gastrointestinal tract proximal to the papilla of Vater.

**3. Other data**

1. **The patient's age and gender** are essential for the diagnosis, since some diseases occur at a certain age. For example, intestinal intussusception usually occurs in children under 2 years of age; appendicitis - in patients no older than 50 years. Young women are more likely to suffer from cholecystitis. At the same time, one should not forget about possible exceptions to these rules.

2. **Medical history**

a. Some drugs and narcotics can provoke exacerbation of surgical diseases of the abdominal cavity. In case of acute abdominal pain that has arisen against the background of taking corticosteroids or nonsteroidal anti-inflammatory drugs, a perforated ulcer should be suspected. Alcohol, thiazide diuretics, pentamidine and azathioprine sometimes contribute to the development of pancreatitis. Sulfonamides and barbiturates can cause an attack of acute intermittent porphyria.

b. Pain-relieving drugs. In peptic ulcer disease and reflux esophagitis, taking antacids reduces the intensity of pain. In peritonitis, it is almost impossible to reduce pain with drugs from the "home medicine cabinet".

**3. Past diseases.** For differential diagnosis, it is important to find out whether this pain attack is repeated or occurred for the first time. For example, gallstone disease and chronic pancreatitis are characterized by recurring pain attacks. With frequent hospitalization for the same type of pain without an apparent cause, simulation should be suspected. It is imperative to find out what operations the patient has undergone. Gynecological history is of significant importance. Inflammatory diseases of the uterus and appendages are often recurrent. Women who have had an ectopic pregnancy have a high risk of its recurrence. During extirpation of the uterus, appendectomy may have been performed.

**II. Physical examination**

The physical examination is performed carefully and consistently. The history and results of the physical examination provide 60% of the information necessary for a correct diagnosis; laboratory data provide only 10-15% of such information.

**A. General condition and basic physiological indicators**

**1. The patient's appearance** allows you to roughly assess the severity of the disease. Look carefully at the patient - is he really suffering or is he comfortably located in bed, watching

TV, talking on the phone. If during palpation of the abdomen the patient complains of pain jokingly and smiling - the presence of an acute surgical disease is unlikely.

2. **The position** that the patient takes to relieve pain is also an important diagnostic sign. With pancreatitis, the patient tends to take the "embryo pose" - the back is bent, the knees and hips are brought to the abdomen. In this position, the pain weakens, as the lumbar muscles, which are irritated by the inflammatory process, relax. With retrocecal appendicitis, patients sometimes bend their right leg in the hip and knee joints: this reduces the pressure of the inflamed appendix on the right lumbar muscle. With diffuse peritonitis of any etiology, patients lie still, as the slightest movement intensifies the pain.

**3. Tachycardia** in acute abdominal pain is caused by fever and hypovolemia. In elderly people suffering from cardiovascular diseases and taking beta-blockers, tachycardia may not be present. Its absence in no case excludes a serious disease of the abdominal organs. An increase in heart rate during examination (if there is no dehydration) is a sign of worsening of the condition.

4. The cause of **tachypnea** in abdominal pain is a decrease in respiratory volume. Accelerated shallow breathing allows you to maintain the minute respiratory volume at the proper level. Tachypnea and respiratory alkalosis often precede metabolic acidosis that occurs in sepsis.

**5. Fever** is characteristic of many inflammatory processes in the abdominal cavity. In the early stages of many serious diseases of the abdominal organs (for example, cholecystitis, appendicitis), there is no fever. If a patient with suspected cholecystitis or appendicitis develops a temperature of 39-40°C in the first few hours of illness, the diagnosis should be reconsidered. The combination of high fever (39.5-40.5°C) with abdominal pain occurs only in bacterial peritonitis and abdominal abscesses. Chills combined with high fever are characteristic of bacteremia; in this case, blood is taken for culture and broad-spectrum antibiotics are prescribed without waiting for a final diagnosis. It is necessary to find out whether the patient has taken antipyretics that mask fever. In dehydrated and elderly patients, the temperature response to inflammation may also be absent. Hypothermia in sepsis is a prognostically unfavorable sign.

**6. Abdominal examination.** The art of examining the abdomen in acute pain is best learned from an experienced doctor. Ignoring painful sensations can anger the patient, make it difficult to communicate with him and ultimately complicate the initial examination and further observation. Particular care should be taken when examining children. All patients with abdominal pain can be conditionally divided into two groups. Patients in the first group have a clinical picture of an acute abdomen and pronounced symptoms of peritoneal irritation. If other examination results confirm the diagnosis (for example, free gas in the abdominal cavity on a survey radiograph with a perforated gastric ulcer), urgent surgical intervention is necessary. The second group includes patients whose condition requires hospitalization to clarify the diagnosis and further surgical intervention (example: pain in the right hypochondrium - cholelithiasis, confirmed by ultrasound - surgery within 24-48 hours after admission to the clinic). The main goal of the initial physical examination is to determine which group the patient belongs to.

The abdominal examination is performed in a specific sequence.

1. Start with an **examination**. Assess the patient's general condition and posture. When examining the abdomen, pay attention to the following signs:

a. Scars and their localization. If postoperative scars are found in a patient with spasmodic abdominal pain, adhesive intestinal obstruction should be suspected. The location

of the scar can be used to conclude the nature of the operation and thereby accelerate the differential diagnosis.

b. Abdominal bloating. Assess the degree of abdominal bloating: as a rule, the more distally the intestinal obstruction is located, the more bloated the abdomen is. With high intestinal obstruction, the abdomen may be retracted, boat-shaped. Local protrusion of the abdomen is often due to a volumetric process. Finally, it is necessary to find out what caused the abdominal bloating - accumulation of fluid (ascites) or gas.

2. The next stage is **auscultation**. The phonendoscope should be warm. Determine the nature of intestinal noises.

a. Weakened intestinal sounds or their absence for several minutes indicate peritonitis or paralytic intestinal obstruction. In local peritonitis, which complicates appendicitis, diverticulitis, etc., intestinal sounds are normal.

b. Increased, sonorous intestinal sounds against the background of spastic abdominal pain are characteristic of mechanical intestinal obstruction.

c. Vascular sounds caused by blood flow turbulence are found in abdominal aortic aneurysm, stenosis of the renal and mesenteric arteries.

3. **Percussion** is always performed after auscultation, since it (as well as palpation) stimulates peristalsis. The following percussion sounds are distinguished: a. A dull sound is given by volumetric processes, free fluid in the abdominal cavity (ascites), and intestinal loops filled with fluid.

b. Tympanic sound is observed in the presence of free gas in the abdominal cavity, accumulation of gases in the intestines.

c. Shift of dull sound when changing body position is characteristic of free fluid, i.e. for ascites.

d. Disappearance of hepatic dullness. Usually, percussion sound over the liver is dull. It becomes sonorous when free gas accumulates between the abdominal wall and the liver and indicates perforation of a hollow organ. With the help of percussion, peritonitis can be diagnosed without resorting to deep palpation. If percussion of the abdomen causes pain, peritonitis is very likely. Patients with peritonitis are very sensitive to the slightest shocks. If the bed is pushed imperceptibly or "accidentally", the patient will immediately complain of pain. On the way to the radiology department, attention should be paid to the patient's reaction when the gurney moves through the doorway or when the gurney hits the wall. Such methods of covert observation are much more important for the diagnosis of peritonitis than deep palpation and the Shchetkin-Blumberg symptom, which often give false positive results.

4. Palpation is the final stage of examining the abdomen. The doctor's hands should be warm. This is especially important when examining children, otherwise the child will resist touch.

a. In order not to cause severe pain at the very beginning of the examination, palpation is started from the least painful area. This allows you to avoid excessive tension of the abdominal wall muscles and maintain contact with the patient. The most painful area is examined last.

b. First, superficial, indicative palpation is performed. The areas of greatest pain are determined.

c. Unilateral tension of the rectus abdominis muscle is a symptom of peritonitis. It is easiest to detect it if the abdomen is palpated with two hands, which are located symmetrically with respect to the white line.

d. Examination of the abdomen is completed with deep palpation. If the diagnosis of diffuse peritonitis has already been established by this point, deep palpation is useless and inhumane. With the help of deep palpation, all organs of the abdominal cavity are methodically examined; pain, tension of the muscles of the anterior abdominal wall are assessed, volumetric formations are detected and the sizes of the organs are determined.

e. A "board-shaped" abdomen is a classic sign of a perforated gastric ulcer. The action of hydrochloric acid on the peritoneum causes severe pain and muscle spasm. Sometimes it is difficult to distinguish true rigidity of the muscles of the anterior abdominal wall from a strong protective reaction. In such cases, the patient is asked to bend his legs at the knees and press them to his stomach - this helps him relax.

**5. Other symptoms**

a. Murphy's sign: severe pain at the height of inspiration with deep palpation of the right hypochondrium. The symptom is often positive in acute cholecystitis, but is not pathognomonic for this disease.

b. Rovzing's sign: the appearance of pain in the right iliac region with deep palpation (or percussion) of the left iliac region. A positive symptom is characteristic of appendicitis, but can also be observed in other diseases.

c. Lumbar muscle symptom: the patient lies on his left side, when extending the right leg, pain occurs in the lower back. It is observed in retrocecal appendicitis and other inflammatory diseases affecting the lumbar muscles - paranephritis, psoas abscess, retroperitoneal hematoma, perforation of the posterior wall of the cecum with a malignant tumor. The same symptom observed when extending the left leg is characteristic of paranephritis, ruptured diverticulum, and sigmoid colon cancer.

d. Symptom of the obturator muscle: the patient lies on his back with his legs bent at a right angle; turning the lower legs inward or outward causes pain. The occurrence of pain is due to an inflammatory process involving the internal obturator muscle or localized near it (pelvic abscess, appendicitis, salpingitis).

d. Kerr's symptom: pain in the shoulder when palpating the lower abdomen, especially in the Trendelenburg position. The symptom was first described in case of damage to the spleen. The pain in this case is caused by the accumulation of fluid in the subphrenic space, radiating to the shoulder and neck.

6. Sometimes there is **increased skin sensitivity** over the focus of inflammation. This is an interesting biological phenomenon, but it has no diagnostic value.

B. **Examination of the perineum, examination of the genitals and rectum** in case of abdominal pain is mandatory for both men and women.

1. Men undergo:

a. Examination of the external genitalia - to detect testicular torsion, tumors, epididymitis, urethral discharge.

b. Examination of the inguinal region and inner thighs - to detect hernias.

2. Women undergo:

a. Bimanual examination of the uterus, fallopian tubes, ovaries. Unilateral soreness or a bulky mass is a sign of pyosalpinx, pyovarum, or torsion of the pedicle of an ovarian cyst. Soreness when the cervix is displaced during examination is characteristic of inflammatory diseases of the uterus and appendages. b. Rectovaginal examination allows you to detect pelvic abscess and retrograde metastases in the pararectal lymph nodes (often with asymptomatic malignant tumors of the abdominal organs). Soreness on palpation of a nodular uterus, especially against the background of infertility, indicates endometriosis.

c. Examination of the cervix in mirrors. A sample of discharge from the uterine pharynx is taken for bacteriological examination (bacterioscopy of a smear stained with Gram and culture).

d. Examination of the groin area and inner thighs - to detect hernias (femoral hernias are much more common in women than in men).

3. **During a digital rectal examination**, which is performed on both men and women, attention is paid to tenderness, bulk formations, and the tone of the anal sphincter. The stool (if present) is examined for occult blood. In men, special attention is paid to the prostate gland (size, consistency, tenderness).

**III. Laboratory tests**

Laboratory tests can provide significant assistance in the differential diagnosis of acute abdomen. However, the results of blood and urine tests, as well as radiological studies, by themselves do not allow either to establish or exclude any of the diagnostic options and are meaningless without a detailed history and physical examination. "It is necessary to treat the patient, not his blood test or X-ray." Laboratory tests that provide valuable information include:

**A. Urinalysis** is an accessible and inexpensive method for detecting kidney and urinary tract diseases. Hematuria confirms the diagnosis of urolithiasis. Leukocyturia and bacteriuria indicate urinary tract infection. Proteinuria is a nonspecific sign. The specific gravity of urine allows you to assess water balance. All these studies can be quickly performed using test strips.

**B. Complete blood count.** The leukocyte count in the blood helps to determine whether abdominal pain is associated with an inflammatory process. Leukocytosis is characteristic of inflammation, although there are many exceptions. For example, in appendicitis, the number of leukocytes in the blood may be normal. Therefore, it is necessary to determine the leukocyte formula, especially in cases where the total number of leukocytes is normal or slightly increased. A shift in the leukocyte formula to the left (an increase in the relative number of immature granulocytes) is a more important diagnostic sign than leukocytosis. A complete blood count allows not only to detect anemia (regarding a decrease in the absolute level of hemoglobin and hematocrit), but also to establish its type (according to the morphology of erythrocytes).

**C. Serum amylase and lipase activity.** The diagnosis of acute pancreatitis is always clinical. Increased amylase and lipase activity confirms the diagnosis. However, it should be remembered that increased amylase activity is a nonspecific sign that is observed in many other diseases (mechanical intestinal obstruction, intestinal infarction, perforated ulcer, ectopic pregnancy). Since amylase is excreted by the kidneys, in renal failure its activity in serum also increases. In acute pancreatitis, amylase activity usually reaches a maximum in a day and normalizes by the end of 2-3 days. Therefore, to confirm the diagnosis, it is advisable to also determine lipase activity. Note that the increase in the activity of both enzymes does not correlate with the severity of pancreatitis. Moreover, in chronic pancreatitis, accompanied by necrosis of the gland, the activity of amylase and lipase may not change. If blood amylase activity exceeds 2000 units/l, calculous pancreatitis should be suspected.

**IV. Instrumental studies**

Women should undergo X-ray and isotope studies only after pregnancy is excluded.

**A. X-ray studies**

1. **Screening radiography.** When referring a patient for an expensive X-ray examination, the doctor must be sure that its result will affect the treatment tactics. For example, a patient

with typical appendicitis complaints, soreness in the right iliac region, tension of the abdominal wall muscles at the McBurney point and mild leukocytosis needs surgical intervention, not radiography. In some diseases, the informativeness of screening radiography is so low that its conduct is not justified. In particular, 10% of gallstones can be detected on the radiograph. If screening radiography is necessary, four images are taken (to detect mechanical intestinal obstruction and free gas in the abdominal cavity):

a. A chest radiograph in the posterior direct projection in the standing position is best suited for detecting free gas in the subphrenic space. In addition, it can be used to detect lung disease, assess the size of the heart, detect free gas in the chest cavity (diaphragmatic rupture) or a hollow organ (hiatal hernia), detect medial displacement of the gastric gas bubble and high elevation of the left dome of the diaphragm (splenic damage), as well as other pathologies.

b. A supine abdominal radiograph can show the distribution of gas in the intestines, determine the cause of abdominal distension (gas or fluid accumulation), and detect fluid-filled intestinal loops, soft tissue compaction, and calculi. 90% of urinary stones (because they contain sufficient calcium) and only 10% of gallstones can be seen on radiographs. Calcification of the pancreas can be seen, a sign of chronic pancreatitis. A calcification in the right iliac fossa, along with the associated complaints and physical examination findings, suggests acute appendicitis. Gas in the bile ducts is a sign of a vesico-intestinal fistula, which can occur with cholelithiasis. The absence of a shadow of the lumbar muscle indicates a pathological process in the retroperitoneal space - bleeding (in case of trauma) or inflammation (retrocecal appendicitis, pancreatitis, sigmoid diverticulitis). Finally, the image allows you to detect pathology of the spine and pelvis.

c. A standing abdominal radiograph is used primarily to detect horizontal fluid and gas levels in the loops of the small intestine. In mechanical intestinal obstruction, the fluid levels in adjacent loops of the intestinal loop are of different heights.

d. A left lateral radiograph. Before the examination, the patient should lie on his left side for about 10 minutes so that all free gas in the abdominal cavity collects in the space between the liver and the diaphragm. The method allows you to detect even a small amount of gas, since the subdiaphragmatic space normally does not contain it. The presence of free gas in the abdominal cavity is not an indication for surgery in itself: its source must be established.

**2. Special methods.**

a. In acute abdominal pain, it is often necessary to conduct X-ray contrast studies of the abdominal organs. Studies of the upper gastrointestinal tract with contrasting amidotrizoate (Gastrografin) or barium suspension are used in cases of suspected esophageal perforation, gastric or duodenal ulcer, when other diagnostic methods are uninformative. Almost all diseases of the upper gastrointestinal tract and small intestine can be detected by endoscopy.

b. Irrigoscopy is used to differentiate small and large intestinal mechanical obstruction in cases where a survey radiograph of the abdominal cavity gives questionable results. Irrigoscopy is contraindicated in cases of colon perforation and peritonitis. The method allows to exclude appendicitis if the contrast medium completely fills the appendix, but does not allow to confirm the diagnosis if the contrast medium does not penetrate the appendix or does not fill it completely. Irrigoscopy has not only diagnostic, but also therapeutic value - for example, in intussusception of the intestine, volvulus of the sigmoid colon. When prescribing the study, it should be borne in mind that the presence of barium in the intestine (even in small quantities) will interfere with CT and angiography.

**B. CT** is one of the best methods for diagnosing diseases of the abdominal cavity, retroperitoneal space, and pelvis. In acute pancreatitis, rapid intravenous administration of

contrast media followed by a series of tomograms allows assessing the extent of pancreatic damage. In trauma patients with stable hemodynamics, CT is more informative than laparocentesis with insertion of a swish catheter with a lavage of the abdominal cavity. In pediatric traumatology, CT is the method of choice for abdominal injuries. With all its advantages, the method is not without some disadvantages (high cost, high radiation exposure, allergic reactions to intravenous administration of contrast media). CT should not replace a physical examination or diagnostic surgery.

**C. Cholescintigraphy** with derivatives of iminodiacetic acid (HIDA - 2,6-dimethyliminodiacetic acid or PIPIDA - paraisopropyliminodiacetic acid) has approximately 98% sensitivity and is highly specific for acute cholecystitis. An unchanged gallbladder is not visible on the scintigram.

Intravenous administration of morphine during the study reduces the frequency of false-positive results. Patients with a classic picture of biliary colic with a negative ultrasound result are subjected to cholescintigraphy with the introduction of cholecystokinin and subsequent determination of the gallbladder ejection fraction. An ejection fraction below 50% is characteristic of biliary dyskinesia.

**D. Angiography** is performed to identify the source of gastrointestinal bleeding, as well as when mesenteric thromboembolism is suspected.

**E. Ultrasound** is the method of choice in the diagnosis of cholelithiasis, which allows to detect stones in the gallbladder and bile ducts. In some complex cases, ultrasound, especially in combination with colour Doppler examination, provides significant assistance in the diagnosis of appendicitis. The presence of a dense oblong mass in the right iliac region and thickening of the mucous and serous membranes of the appendix (pathognomonic signs) indicate acute appendicitis. Women with complaints of pain in the lower abdomen are shown an ultrasound of the pelvis. Intraoperative ultrasound facilitates the diagnosis of liver and pancreatic diseases. Recently, rectal and vaginal ultrasound have been increasingly used. In case of stomach cancer, endoscopic ultrasound can determine the stage of the disease.

**F. Peritoneal lavage** is used mainly for blunt abdominal trauma, but it can also be useful in the diagnosis of acute abdomen. Indications for peritoneal lavage, in addition to trauma, include: ambiguous results of physical examination, impaired consciousness and unstable hemodynamics.

**G. Diagnostic** laparoscopy has recently become increasingly widespread. It is used in critical conditions and doubtful results of physical examination. The study can be performed at the patient's bedside under local anaesthesia, this is its main advantage over diagnostic laparotomy, which is performed in the operating room. Diagnostic laparoscopy is indispensable in the examination of women with pain in the right iliac region. In this category of patients, up to 30% of appendectomies are erroneous. Laparoscopy allows you to reduce the number of unjustified surgical interventions and obtain a more complete picture of the condition of the abdominal organs.

**Table. Differential diagnosis for severe epigastric pain**

| | Perforating ulcers of the stomach or duodenum | Acute pancreatitis | Acute cholecystitis | Aneurysm rupture | Intestinal ischemia |
|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| Pain onset | Suddenly, the pain is very strong | Gradual | Gradual | Suddenly, accompanied by collapse | Suddenly |
| Localization of pain | Epigastric region; pain quickly becomes diffuse | Epigastric region, right and left hypochondrium | Right hypochondrium, epigastric region | Umbilical region | Diffuse pain without clear localization |
| Pain irradiation | Usually none | Back: pain in the projection of the organ or girdling | Back, right shoulder and under the right shoulder blade | Back, groin area | None |
| Vomiting | No or 1-2 times | Many times | Once or twice | Sometimes | Sometimes, or 1-2 times |
| Alcohol consumption | Effects differently | Usually present before onset of pain | Does not affect | Does not affect | Does not affect |
| Past attacks of pain | History of peptic ulcer disease (in 50%) | Often; this attack is similar to previous ones | Often; this attack is more severe | No | No |
| Inability to eat | Spicy food, alcohol | Fatty food (steatorrhea) | Fatty and fried foods | No | No |
| Shock | Characteristic of the early stage of the disease | Characteristic of the late stage of the disease | Uncharacteristic | Characteristic of the early stage of the disease | Characteristic of the late stage of the disease |
| Shchiotkin-Blumberg symptom | Appears early, from the first minutes | Appears late, after a few hours or days | Rarely | Sometimes | The intensity of the pain does not coincides with the severity of the symptom |

| | Perforating ulcers of the stomach or duodenum | acute pancreatitis | Acute cholecystitis | Aneurysm rupture | Intestinal ischemia |
|---|---|---|---|---|---|
| Pain on palpation | diffuse | In the epigastric region or diffuse | In the right hypochondrium, epigastric region | In the umbilical region | diffuse |
| Abdominal wall muscle tension | "Board-shaped" stomach | Moderate | Unilateral tension of the rectus muscle | Rarely | Rarely and only in the late stages of the disease |
| Bowel noises | No | Weakened or absent | Normal or impaired | Weakened or absent | Weakened or absent |
| Soreness in the costovertebral angle | No | Easy, on both sides | easy on the right | No or mild on both sides | No |
| Patient position | On the back, the patient is motionless | "fetal position", desire to vomit | On back, outwardly calm | On the back, restless | On the back, the patient is very restless |
| Survey radiography of the abdominal organs | Free gas in the abdominal cavity (in 70%), symptoms of intestinal obstruction | Symptoms of intestinal obstruction, swelling of individual loops, small intestine, large intestine | Intestinal obstruction is uncharacteristic; possible gallstones (in 10%) | Aorta with lime deposits | Symptoms of intestinal obstruction |
| Ultrasound | No specific signs | Enlargement of the pancreas | Thickening of the pancreatic wall, gallstones | Free fluid in the abdominal cavity; thickening of the abdominal aortic wall | No specific signs |
| CT | No specific signs | Enlargement of the pancreas and swelling of surrounding tissues | Not shown | Free fluid in the abdominal cavity, dilated aorta with surrounding hematoma | No specific signs |

| | | | | | |
|---|---|---|---|---|---|
| | Perforating ulcers of the stomach or duodenum | acute pancreatitis | Acute cholecystitis | Aneurysm rupture | Intestinal ischemia |
| Laboratory studies | Amylase activity is slightly elevated; slight to moderate leukocytosis | Huge increase in amylase levels, azotemia, decreased calcium and magnesium levels, moderate to high leukocytosis | Amylase activity is most often normal (except in biliary pancreatitis, leukocytosis | Low hematocrit, leukocytosis | Sometim es mild increase in amylase, azotemia |

## 5. Lesson plan and organizational structure

| № | The main stages of the lesson, their function and content | Learning objectives in learning levels | Control and training methods | Methodological support materials | Time /min |
|---|---|---|---|---|---|
| **1** | **2** | **3** | **4** | **5** | **6** |
| **Preparatory stage** | | | | | |
| **1.** | **Organization of the lesson** | | | | **5 min** |
| **2.** | **Setting learning goals and motivating the topic** | | | | **10 min** |
| **3.** | **Control of the initial level of knowledge, skills, abilities.** | | | | 60 min. |
| | A) medical achievements in the study of the concept of "acute abdomen"; modern views on the etiology and pathogenesis of acute surgical pathology of the abdominal cavity | II | Tests | Tables, slides | |
| | B) classification of acute surgical pathology of the abdominal organs; clinical features of the course of acute surgical pathology of the abdominal organs; | II | 1. Individual oral interview. 2. Written theoretical interview. | Tables, slides. | |
| | C) additional examination methods, mandatory laboratory, auxiliary (X-ray, ultrasound, etc.), which are used in doubtful cases | II | 3. Solving typical problems. | Medical history, data from X-ray, ultrasound, EGDFS, and other instrumental and laboratory research methods | |

| | | | | | |
|---|---|---|---|---|---|
| **Main stage** | | | | | |
| **4.** | **Formation of professional skills and abilities** | | | | |
| | A) discussion and evaluation of results of clinical diagnostics, differential diagnostics | III | Practical training skills development method | Educational equipment – orienteering maps | 130 min. |
| | B) Discussion of methods of surgical intervention on the abdominal organs in patients with "acute abdomen", choice of surgical access | III | Method of skill formation | Atypical tasks in the form of: patient, medical history, test situational tasks, business games, dressing | |
| | C) Features of postoperative management and patient rehabilitation | III | a) Professional training in solving atypical problems | Situational tasks | |
| | D) Prevention, medical and social examination. | III | b) solving laboratory research problems | | |
| | E) Practical skills for examining a patient with an “acute abdomen” | III | Practical skills control | Practical skills cabinet | |
| **Final stage** | | | | | |
| **5.** | **Control and correction of the level of professional skills and abilities** | III | Control method: Individual control of practical skills | Test tasks | 60 |
| **6.** | **Summarizing the results of the lesson** | | | | 3 min. |
| **7.** | **Homework, educational literature on the topic** | | | Oriented map for independent work with 3 literature | 2 min. |

## 6. Materials for methodological support of the lesson.

## 6.1. Control materials for the preparatory stage of the lesson.

## Questions

1. Anatomical and physiological features of the structure and relationship of the abdominal organs.
2. What is an acute abdomen, tactics in case of suspicion, actions.
3. Criteria for assessing the condition of patients with acute surgical pathology of the abdomen.

4. Diseases that simulate an acute abdomen in the practice of a therapist, urologist, gynaecologist.
5. Principles of providing emergency care in acute surgical

**Situational tasks**

1. Patient S., 32 years old, was hospitalized in a surgical hospital with complaints of pain throughout the abdomen, without clear localization, dizziness. She fell ill gradually. From the anamnesis: she suffers from diabetes, uses insulin, but during the last week she has not used insulin due to its absence. Blood test for glucose content - 18.6 mmol/l. What pathology is most likely? What tactics are necessary for this patient?

**Answer model: The patient has a false acute abdomen. It is necessary to prescribe insulin in a hospital setting to prevent diabetic coma.**

2. Patient N., 44 years old, complained of pain in the right iliac region, nausea, vomiting, elevated body temperature. She has been ill for 2 days. What is the preliminary diagnosis? What is the further examination tactics, where to conduct the examination?

**Answer model: Acute appendicitis. Surgical treatment is indicated.**

**3.** Patient M., 30 years old, has a history of duodenal ulcer. He became ill acutely, 1.5 hours ago. He complained of acute abdominal pain, inability to move due to increased pain. What complication of peptic ulcer can be suspected? What is the necessary examination to confirm this diagnosis?

**Answer model**: **Perforation of duodenal ulcer. Survey radiography of the abdominal cavity.**

**6.2. Control materials for the final stage of the lesson**

**Situational tasks**

1. A 45-year-old patient fell ill a day ago, 4 hours after eating a large amount of fatty food and drinking alcohol, he felt unwell. He complains of nausea, vomiting, abdominal pain that radiates to the back. What will be the preliminary diagnosis? What should be the differential diagnosis with?

**Answer model**: **Acute pancreatitis. Complications of peptic ulcer disease, acute cholecystitis.**

2. A 35-year-old woman was admitted to a surgical hospital with a diagnosis of acute calculous cholecystitis. Examination revealed mechanical jaundice in the patient. Conservative therapy was ineffective. What complication of calculous cholecystitis did the patient develop? What further tactics are necessary for the patient.

**Answer model**: **Choledocholithiasis. Surgical intervention is indicated for acute cholecystitis and choledocholithiasis.**

3. A 28-year-old woman was admitted to the hospital with suspected acute appendicitis. However, on examination, the patient is not feverish and is in the middle of her menstrual cycle. What disease should be considered for differential diagnosis?

**Answer model**: **Ovarian apoplexy.**

**• What are the contraindications to emergency appendectomy in acute appendicitis?**
A. Appendicular infiltrate.
B. Myocardial infarction.
C. Second half of pregnancy.
D. Hemorrhagic diathesis.
E. Disseminated peritonitis.

**• Emergency appendectomy is not indicated in:**
A. Acute simple appendicitis.
B. Acute appendicitis in the second half of pregnancy.
C. At the first attack of acute appendicitis.
D. At an undetermined factor of pain in the right iliac region.

**• Which symptom is not characteristic of perforation of a hollow organ?**
A. Acute abdominal pain.
B. Disappearance of hepatic dullness.
C. The patient is constantly looking for a comfortable position, walking around.
D. All of the above.
E. None of the above.

**• Contraindications to surgical treatment for strangulation of a ventral hernia are:**
A. Giant size of the hernia.
B. Pregnancy in the second half.
C. Phlegmon of the hernial sac.
D. Recent myocardial infarction.
E. None of the above.

**• What is the most informative method of investigation in case of suspected acute appendicitis?**
A. Ultrasound of the abdominal organs.
B. X-ray of the abdominal cavity.
C. ECG.
D. Laparoscopy.
E. MRI.

**• In what condition does appendicular infiltrate most often occur?**
A. Acute appendicitis.
B. Acute pancreatitis.
C. Acute cholecystitis.
D. Acute peritonitis.
E. Acute renal failure.

**• The main method of treatment of appendicular infiltrate at the stage of conservative therapy?**
A. Antibacterial therapy.
B. Surgical intervention.
C. Administration of anti-inflammatory drugs.
D. Infusion therapy.
E. Laparoscopy.

**• What is the most characteristic symptom of acute appendicitis?**
A. Pain in the right iliac region.
B. Pain in the left hypochondrium.
C. Nausea and vomiting.

D. Fever.
E. Diarrhea.

**• What is the main indication for emergency appendectomy in acute appendicitis?**
A. Confirmation of the diagnosis of acute appendicitis.
B. Absence of inflammation in the right iliac region.
C. Detection of appendicular abscess.
D. Suspicion of gastric perforation.
E. Suspicion of acute pancreatitis.

**• What is the main complication in acute appendicitis that requires immediate appendectomy?**
A. Development of peritonitis.
B. Loss of consciousness.
C. Increased blood pressure.
D. Low back pain.
E. Mild nausea.

## 6.3. Materials for methodological support of self-training of higher education applicants

| № | Main tasks (to study) | Instructions (to name) |
|---|---|---|
| 1. | Anatomical and physiological features of the abdominal organs | Structure of organs<br>- - Relationship of abdominal organs with peritoneum |
| 2. | Features of clinical signs of acute abdominal diseases | - clinical picture of:<br>a) acute appendicitis; b) acute cholecystitis; c) acute pancreatitis<br>d) perforated gastric and duodenal ulcer |
| 3. | Methods of examination of patients with "acute abdomen" | - Physical examination;<br>- Gastroscopy;<br>- X-ray examination;<br>- Ultrasound;<br>- Laboratory tests;<br>- Laparoscopy |
| 4. | Indications for surgical intervention in acute abdomen | - determination of life-threatening condition.<br>- priority of maternal health.<br>- in late pregnancy, decision on simultaneous cesarean section. |
| 5. | Surgical treatment methods for acute abdomen | - features of access in pregnant women with pathology of the abdominal organs, the use of laparoscopy. |

**Literature:**


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